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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/958,568 10/28/97 OHTANI

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MMC2/0921

EXAMINER

HILLS

ART UNIT

PAPER NUMBER

2811

DATE MAILED:

09/21/00

Please find below and/or attached an Office communication concerning this application r  
proceeding.

Commissioner of Patents and Trademarks

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# Office Action Summary

Application No.  
**08/958,568**

Applicant(s)  
**Ohtani et al.**

Examiner  
**Shouxiang Hu**

Group Art Unit  
**2811**



☒ Responsive to communication(s) filed on Jul 10, 2000

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claim

☒ Claim(s) 13, 14, 19-28, and 56-85 is/are pending in the application

Of the above, claim(s) 13, 14, 19-28, 56-59, and 63-72 is/are withdrawn from consideration

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 60-62 and 73-85 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☒ The proposed drawing correction, filed on Nov 29, 1999 is ☐ approved ☒ disapproved.

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 9

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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## **DETAILED ACTION**

### ***Election/Restriction***

1. Claims 13, 14, 19-28, 56-59 and 63-72 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention and being canceled, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 12.

Claims 60-62 and 73-85 are active now.

### ***Drawings***

2. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on Feb. 24, 2000, have been objected as each or all of Figures 2A - 2F should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

### ***Specification***

3. Claims 60-62 and 73-85 are objected to because of the following informalities:

The term "interconnect" recited in these claims should read as --interconnection--, since the word "interconnect" is not a noun.

In addition, "a top layer interconnected " recited in claim 61 should read as --a top layer interconnection--

Appropriate correction is required.

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***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 60, 77 and 78 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 60 recites a metal layer being in direct contact with a gate electrode and a source/drain region of a same thin film transistor. However, according to the disclosed final structure shown in Fig. 1(F), the gate electrode, or more precisely, the gate interconnection layer, and the connected source/drain region do not belong to a same transistor.

6. Claims 61, 62, 73-76 and 79-85 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 61, 73, 74, 75 and 76 recite "a metal layer; however, according to Applicant's selected species of Figs. 1(A)-1(F), the conductive layer (13) is no longer a pure metal layer after being heat-retreated at high temperature for forming the silicide contacts (11). Normally it comprises metal compound(s), such as metal nitride.

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***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 60-62 and 73-85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art shown in Figs. 2(A)-2(B) in view of Tang et al. (4,890,141).

Applicant's claimed invention differs from Applicant's admitted prior art shown in Figs. 2(A)-2(B) in that: the admitted prior art does not comprises a conductive layer comprising Ti and being in direct contact with a source/drain region and a gate interconnection. However, Tang et al. (4,890,141) teach to form a semiconductor device (Figs. 1-4) comprising a conductive layer comprising Ti (202) and being in direct contact with a source/drain region (204 or 206) and a gate interconnection (212) through no contact hole.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to incorporate the no-contact-hole conductive layer structure of Tang et al. (4,890,141) into the semiconductor device disclosed in the admitted prior art , so that an improved electrical connection between the gate interconnection and the source/drain region would be achieved with a simplified process.

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Regarding the limitation of a top layer interconnection connected to the conductive layer through an opening in an interlayer dielectric layer, recited in claims 61, 62, 73-76, 79, 80, 82 and 84, it is noted that it is commonly known in the art that an interlayer electrical connection can be formed through an opening in an interlayer dielectric layer. And, ordinary skilled in the art should be able to recognized that the opening for the interlayer connection can be outside of the source/drain region, if it is formed in the no-contact-hole conductive layer structure of Tang et al. (4,890,141), as the source/drain region is already connected by the conductive layer.

Regarding claims 74 and 75, it is noted that both silicon oxide and silicon nitride are among the most commonly used interlayer dielectric materials.

### ***Response to Arguments***

9. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 or 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to ***Shouxiang Hu*** whose telephone number is **(703) 306-5729**. The Examiner is in the Office generally between the hours of 8:00AM to 5:30PM (Eastern Standard Time) Tuesday through Friday.

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Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **(703) 308-0956**.

Shouxiang Hu

September 15, 2000

  
Minh Loan Tran  
Primary Examiner